Zero Retries issue 0032 2022-02-11

Advanced Amateur Radio - Data Communications; Space; Microwave… the fun stuff! The Universal Purpose of Ham Radio is to have fun messing around with radios - Bob Witte K0NR. Ultimately, amateur radio must prove that it is useful for society - Dr. Karl Meinzer DJ4ZC. We are confronted by insurmountable opportunities! - Pogo. Nothing great has ever been accomplished without irrational exuberance - Tom Evslin. Irrational exuberance is pretty much the business model of Zero Retries Newsletter - Steve Stroh N8GNJ.

In its mission to grow Amateur Radio and make it more relevant to society in the 2020s and beyond, Zero Retries is published via email and web, and is available to anyone at no cost. Zero Retries is proud not to participate in the Amateur Radio Publishing Industrial Complex!

Steve Stroh N8GNJ, Editor

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In this issue:

- **Request To Send**
- **Bob Bruninga WB4APR Transitions to Silent Keyboard**
- **Wither APRS?**
- **Upcoming "Zero Retries Interesting" Events**
- **ZR > BEACON**
- **Join the *Fun* on Amateur Radio**
- **Closing The Channel**

Request To Send

Countdown to Hamvention 2022 - May 20-22, in Xenia, Ohio - 14 weeks…

I was having fun writing a story speculating about an idea I had (two, actually) when the news about Bob Bruninga's WB4APR's transitioning to Silent Keyboard began circulating. As my tribute to WB4APR, and what his accomplishments meant to those of us that do ***Advanced Amateur Radio - Data Communications; Space; Microwave… the fun stuff!*** grew, the Substack Editor flagged this issue as too big to email. So, (familiar story of late…) those stories got punted ahead. WB4APR's passing is timely - the other articles will keep another week or two.

Bob Bruninga WB4APR Transitions to Silent Keyboard

On Tuesday, 2022-02-08 I received this note, forwarded from Brian Webster N2KGC.

> It is with great sympathy that I need to inform you that, on February 7th (yesterday), Bob finally succumbed to his 2+ year battle with cancer - coupled with a struggle with COVID-19 over the past few weeks.
> His daughter, Bethanne, just emailed me a few minutes ago and I cannot think of any group as deserving of immediate notification as those that are part of a project as important as the Appalachian Trail Golden Packet.
> Jeff Hochberg W4JEW

I looked around on Twitter and saw no mentions (from those I follow) so I posted this:

> I'm sad to report that Bob Bruninga WB4APR, the father of APRS, is now a silent keyboard. Bob leaves behind a very vibrant APRS ecosystem... but we will miss his “velvet czar” influence in keeping the many and varied APRS implementations compatible with each other.

That tweet is now my most popular one to date. 😕 I had no way of knowing how on-target that reference to *“velvet czar” influence* was - see next article.

I can’t claim to have known WB4APR. I certainly knew him by reputation as the person who had the bright idea to stuff a package of equipment including a (then exotic) GPS receiver, a TNC, a battery, and a radio into a football which was run (yes, run, as in *on foot*) 130 miles between Annapolis, Maryland to Philadelphia, Pennsylvania. (I could not find a definitive date when this was first done.) Prior to APRS, tracking the progress of the football was a manual process; periodic status reports were called out via radio. After the advent of the “APRS Football”, you could watch its progress plot automatically on an electronic map.

From that idea of mashing together a GPS receiver, a packet radio TNC, and a computer with a map program plotting the latitude / longitude coordinates transmitted by the GPS / TNC… Automatic Position Reporting System (APRS) was born. (At least, this is the legendary genesis of APRS that I’ve heard throughout my Amateur Radio career. I’ve read other references that differ. But I’ll stick with this one because it’s just a more fun and quirky origin story of APRS.) At some point, in recognition of its capability to transmit and display information other than positions, WB4APR changed the acronym to Automatic *Packet* Reporting System.

WB4APR was a master at effective use of “trailing edge technology”. He made the slow speeds of 1200 bps AFSK AX.25 packet radio into a virtue by making APRS data being transmitted as compact and efficient as possible. His vision in persisting with “simple, easy, cheap” 1200 bps AFSK AX.25 was prescient as APRS “trackers” became more and more compact because of the reduction in the size of chips needed, and microcontrollers could do almost all of the work that previously required a larger, power hungry TNC. I have one tracker that’s the size of a deck of playing cards, including battery.

I had met and talked to WB4APR several times at conferences and at some of his many Hamvention appearances. My most recent interaction with him was his presentation at the (online) 2021 MicroHAMS Digital Conference. I had suggested to the organizers to offer WB4APR a speaking slot and to my surprise, he agreed to do so - see WB4APR's 2021 MicroHAMS Digital Conference presentation on YouTube.

It wasn't hard to pick out WB4APR in the throngs at events because he always had an entourage of people wanting to talk to him. You could also just wander around the flea market at Hamvention until you stumbled upon the weirdest Toyota Prius you'd ever seen - solar panels bolted onto every surface except the windshield and windows. It was also possible to pick WB4APR out of a crowd by ear from his habit of talking fast - he had a lot to say! Despite his influence in Amateur Radio from creating Automatic Packet Reporting System (APRS), WB4APR was (usually) gracious, enthusiastic, and humble (like all of us humans, he had his "moments"). Most of all, WB4APR was infectious with his enthusiasm for new ideas. If you came within his orbit for even a little while, it was impossible to not be inspired to some degree.

WB4APR was the czar of APRS; when he suggested a change or feature, all the players in APRS adopted it, not because WB4APR decreed, or demanded, or ever shamed people into doing so. When there were potential major divergences from "general compatibility with the majority of APRS implementations", WB4APR could usually broker a compromise. That fast, widespread adoption of APRS was a sign of respect for WB4APR's ability to build consensus in the service of APRS interoperability in Amateur Radio.

Just a tiny example of WB4APR's influence was in the aftermath of last weekend's Winter Field Day here in Whatcom County. My friend Andy Sayler KF7VOL had "overprepared" a bit for his / our first foray into Winter Field Day. I joked that instead of all the generators, batteries, etc. that we used, we should have taken a page from the WB4APR playbook and just rolled someone's Toyota Prius onto the field, tapped off the Prius' 12 volt battery to run all the rigs, left the key in the "On" position, and let the Prius start and stop the engine to top off the 12V battery as necessary. My suggestion was just parroting one of WB4APR's ideas.

Another tiny example of the reach of APRS was an article I just completed about VARA. VARA is a robust file transport mechanism usually used in conjunction with the worldwide Winlink email-via-radio system. I ~~don't~~ didn't think of Winlink and APRS as being used together… but VARA's author did. From the document VARA KISS Interface:

> The KISS Interface provides a connection for DATA Packet applications with Network KISS capabilities, such as PinpointAPRS and similar.
>
> …
> The KISS Interface was designed to work on tactical or dedicated VARA frequencies and for manual, operator controlled beaconing.

In reading some other tributes to WB4APR, however big a deal we Amateur Radio Operators might think of APRS, that may well not have been WB4APR's greatest contribution to society. WB4APR's day job (which he joyfully intertwined with his Amateur Radio "hobby") was as an instructor at the US Naval Academy. He must have influenced thousands of officers in training during his years there. Those are stories for others to tell. ARRL's tribute to WB4APR provides

some details.

In the coming weeks, others who knew WB4APR better than I did will undoubtedly tell better stories than I can about his many experiments and ideas. www.aprs.org is WB4APR's page of APRS information, ideas, and links. He just spawned off ideas and wasn't afraid to venture beyond APRS and Amateur Radio, as evidenced by the "hidden" portion of his website - www.aprs.org/sitemap.html of all his interests besides APRS. WB4APR might have been a late convert to publishing his ideas on the web, but apparently he made up for that late start, to the tune of 2.76 GB of info. Of late, his primary interest had become alternative power, including writing what was probably his last book - Energy Choices for the Radio Amateur.

As for me, I'll think of WB4APR every time I glance at one of my Kenwood TM-D710A radios, which embeds an APRS tracker and APRS receiver / display into a radio that (mostly) doesn't need a computer for displaying situational awareness via APRS. WB4APR worked with Kenwood to create that unique radio. (I'm told that WB4APR had influence on other Kenwood radios with built-in APRS, but I can only find online confirmation of his influence on the TM-D710A.) I also found a YouTube video of WB4APR explaining his relationship with Kenwood.

One of the most interesting "morphings" of APRS is trackers for very lightweight balloons that can traverse the world, some of them multiple times. The "trackers" for such balloons use very lightweight solar panels (no backing - just the paper-thin and thus very light silicon sheets) and no batteries. When the balloon is in sunlight, it has power to transmit. I'll guess WB4APR was proud of that development. Another "morphing" is the use of APRS outside Amateur Radio - all manner of devices are being tracked using APRS with LoRa technology.

Other tributes to WB4APR mention that he was 73 at the time of his death. I can only imagine that, although that's way too soon for someone like WB4APR (or any of us), there was probably at least a moment of mirth in his mind knowing that his passing would be marked, by us hams, as an "Ultimate 73".

WB4APR leaves us, and Amateur Radio, better than he found it. We would be poorer without his many contributions. He made his unique dent in the universe, and we will forever respect him for that, and will miss him. Godspeed WB4APR!

There were several moving tributes to WB4APR on the Northwest APRS mailing list, and I asked for permission to quote them here in Zero Retries, but received no answer. NWAPRS is a public group with open archives, so you can see them for yourselves.

Wither APRS?

Steve Dimse W4HG on the TAPR APRS Special Interest Group (APRS SIG) mailing list:

> Yes, it is true. Amateur radio has lost a true pioneer in its transition to the digital age. I will certainly miss him. We often argued, but I deeply respected him. I'm glad I had the chance to express that to him unequivocally before his death. When he was diagnosed he was not expected to last 6 months but he made it two years, and it took covid to finish the job. He was tough as well as brilliant.

> Bob did not want to make a big deal of his cancer and did not want sympathy, so he only told a few people. He did drop a few hints over the last two years though. Bob tried to get a group of active programmers in APRS to come together, but no one stepped forward. We talked about it, and I told him I thought it would not happen until he made his diagnosis public and involved the larger community. He did not want to do that, so I agreed to help as I could. I have control of aprs.org, and TAPR has the paperwork to transfer the APRS trademark.
>
> The APRS community has some choices to make. I am no spring chicken myself, and I have no desire to assume Bob's throne on top of APRS. However I am not going to just hand responsibility to a single person. This needs to be a community effort and not become dependent on a single person. We need to use this sad opportunity to strengthen APRS. I hope people will step forward to form a group to assume the leadership role. I would like to see a non-profit formed with a real board of directors, bylaws, and open membership. But I'm not going to do it - collaboration is not one of my strengths either!
>
> I am sure TAPR will be willing to help in any way it can, and a real APRS group should be able to secure a grant from ARDC (ampr.org) for funding itself. If you weren't aware ARDC, which has held the 44.0.0.0/8 IP allocation since the beginning, sold an unused quarter of the allocation to Amazon for $108 million a couple years back, and has been giving out grants for worthy ham radio projects.
>
> This can be a beginning of a new era for APRS if a few people are willing to take on a lot of unpaid, under-appreciated effort. If that doesn't happen, I will update the aprs.org pages with new user-defined packet definitions and to-calls. I will not be drawn into discussion about protocol changes, new icons, or other such minutia. Other than housekeeping details, the protocol is not officially changing until an open membership group steps up and takes over. Without the ability to change, people may decide to implement changes unilaterally, which will not be good for the community.
>
> Bob loved APRS, and he wanted it to thrive after his death. But for all his flashes of brilliance he was never good at creating a collaborative group. We tried to help him by creating the APRS Working Group in the early 2000s but he never did anything with it once we created the protocol and stepped aside. It is time for someone to step into his shoes and lead, or APRS will decline.
>
> It is in your hands.

If you want to get involved with the future of APRS, APRSSIG is the center of the APRS universe. I've just rejoined that list to follow what comes next.

On the one hand, Amateur Radio has come together for such standards work in the past, notably AX.25 and of course APRS. But that was a different era, decades ago. Whereas the creation of AX.25 resembled a formal standards effort (not too dissimilar to professional standards bodies), (my perception of) APRS "standardization" was more akin to the old motto about creating standards within the Internet Engineering Task Force (IETF):
Rough consensus and running code.

In a subsequent post about APRS standards, Lynn Deffenbaugh KJ4ERJ posted these links:

> http://www.aprs.org/doc/APRS101.pdf
> http://www.aprs.org/aprs11.html
> http://www.aprs.org/aprs12.html

So, at least there's that. I do hope there can be a group that comes together for formal, or even informal stewardship to keep implementations of APRS and the ecosystem interoperable. I'm also glad that aprs.org and the APRS trademark are under stewardship.

This soft of situation was anticipated several years ago and a concept called Amateur Radio Engineering Task Force (ARETF) was created. Those who created it got busy with other activities. Later I put some energy into it and considered reviving it for work on an open source equivalent of VARA, but I decided that my energy and time was better spent on Zero Retries. I think the idea of ARETF is a good one, but I'm not well-connected enough to have a realistic chance of making it a reality.

Lastly, WB4APR offers a sobering reminder that none of us get out of this alive, despite our best efforts and hopes, *we don't know how much time we have*. So make the most of your life while you can. In a December 2020 YouTube video, WB4APR mentions briefly that two weeks after his retirement, he was diagnosed with cancer.

Upcoming "Zero Retries Interesting" Events

2022-03-12 and 13 - QSO Today Virtual Ham Expo - Online

They have *me* with these *two* presentations (out of many):

> **Keynote: The importance of Amateur Radio and technical hobbies to advance the world's technology and "mankind's biggest projects"**
> Presenters:
> Courtney Duncan N5BF
> Level: General Audience
> Category: Future of Amateur Radio, Ham History, Keynote, Radio Astronomy
> Missions to deep space, the Moon and Mars, supported by engineers and technicians at JPL and NASA, many of whom are amateur radio operators, demonstrate that serious avocational pursuits such as amateur radio are often crucial to goals ranging from project success, to the creation of new fields of research. Courtney will support this thesis from his hands on experience at JPL, NASA's Jet Propulsion Laboratory, over a 35 year career.
>
> **An Exploration of the FlexRadio TCP/IP Radio API**
> Presenters:
> Annaliese McDermond NH6Z
> Level: Intermediate
> Category: DSP and Software Design, HF Digital Modes, Homebrew and Construction, HF Station Integration
> This presentation will provide an introduction to the on-the-wire FlexRadio TCP/IP

API with live examples of functionality and usage. In addition the presenter will cover programming resources to obtain more information and pointers to implementations of the API for various languages. Also the “Waveform API” will briefly be explored.

Brief aside… How you connect the various FlexRadio units such as displays, amplifiers, radios, etc.? Answer: **TCP/IP over Ethernet.** *Love It!*

2022-03-22 - (5th Annual) Utah Digital Communications Conference - In person in Sandy, Utah, USA

Intro to the NanoVNA – Antenna analyzer and more
Five minutes to digital communications with the ICOM 705
Winlink, ARES subjects
DMR: What can I do now that I have a DMR Radio?
How to measure a common mode choke with the nanoVNA
DSTAR
Digital Modes on Amateur Satellites
Evaluating your ham radio station for EMF (new fcc requirements)
ARDC introduction and update
Smith Charts ... What, Why, and How
Mastering the Art of Hidden Transmitter Hunting

2022-05-07 - (15th Annual) MicroHAMS Digital Conference - Online

Per Scott Honaker N7SS on behalf of the MicroHAMS Digital Conference team:

Since 2007 the Microsoft Amateur Radio Club (MicroHAMS) has held a conference with a focus on digital communications. The conference offers a variety of topics across a range of skill levels. Our motto is “Inspire, Inform and Educate”. This year is the 15th annual MicroHAMS Digital Conference. Like the last two years, the 2022 conference will be streamed and at no charge (donations welcome) on May 7, 2022. One of the virtues of going online is that we can invite presenters that would be impractical to bring to the Seattle area. The latest updates will be published on the MicroHAMS web site at http://www.microhams.com/mhdc/. The conference can be streamed live on YouTube so there can be an unlimited number of attendees. This year the conference is available at no charge but we do request a donation via the web site to cover our expenses. There is a chat channel in YouTube to ask questions and these will be passed to the presenters at the end of the presentations during a Q&A session. To provide a more interactive experience, there will be a Zoom breakout room available at the end of the session where the presenters can hang out and answer questions in person for the next hour. Of course, the whole thing will be recorded on YouTube and available for viewing later if you miss anything. We hope to see you May 7, 2022!

ZR > BEACON

- Congratulations to Zero Retries Pseudostaffer **Jeff David KE9V** for successfully exiting the "doing things for someone else's agenda" phase of career / life. Watching what KE9V has accomplished within Amateur Radio on a time-available basis, I can't wait to see what happens next. Take some time off, KE9V (but not too much) 😀

- Experimental Radio News(letter) - **Bennett Z. Kobb AK4AV** is a long-time colleague from my career writing about Wireless ISPs and practicing "Kremlinology" on the activities of the FCC, and especially some of the quirkier, murkier radio services and licensees. AK4AV is much, much better at the latter than I am, and is a fantastic writer. His classic book Wireless Spectrum Finder is a fantastic resource for understanding the arcane ways that the FCC has partitioned up the electromagnetic spectrum and created byzantine useage prioritizations through the end of the 20th century. (In this era, it's "cellular, stupid - what was the question again?") Despite its lack of updates, Wireless Spectrum Finder is a primary reference for me in writing about wireless and Amateur Radio.

  After a long hiatus, AK4AV has returned to writing and you can imagine my delight at discovering his newsletter - **Experimental Radio News**. It's fantastic reading - the third issue linked above is a fascinating exploration about the surreptitious methods being used with FCC Experimental Licenses to try to tiptoe around FCC rules regarding high power shortwave broadcast stations to ultimately be used for transmitting information about stock trading. (Nothing happening here - we're just "broadcasting" like it says on our license.)

  I talk about scratching my own itch with Zero Retries, as in "if I could just read Zero Retries Interesting stories, I wouldn't feel compelled to write them". Experimental Radio News is in that class of writing. If you like Zero Retries, you're going to love **Experimental Radio News** - highly, highly recommended!

Join the *Fun* on Amateur Radio

If you're not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, here are some pointers:

- **Ham Radio for Dummies** by Ward Silver N0AX is a great overview of Amateur Radio. N0AX is a gifted writer and HRFD is now in its 4th edition.

- My two favorite **YouTube** channels for a good overview of Amateur Radio are AmateurLogic.TV. and Ham Nation (part of Ham Radio Crash Course). These folks just seem to have so much fun!

- Radio Amateur Training Planning and Activities Committee (**RATPAC**) offers weekly presentations on general Amateur Radio topics (Wednesdays) and emergency communications in Amateur Radio (Thursdays).

- Dan Romanchik KB6NU offers a free **No-Nonsense Study Guide** for the Technician test (PDF).

- HamExam.org Amateur Radio Practice Exams offers good **Flash Card and Practice Exams**.

- When you're ready to take an **Amateur Radio examination** (Tech, General, or Extra), W1MX - The MIT Amateur Radio Society offers remote exams, free for students and youngsters. *There are apparently many other remote exam options*.

Bonus - with an Amateur Radio license, you'll be more attractive on dates 😀

Closing the Channel

- My ongoing Thanks to Tina Stroh KD7WSF for, well, *everything*, Bill Vodall W7NWP as *Zero Retries Instigator in Chief*, and Larry Gadallah NM7A for his long term encouragement about Zero Retries.

- My ongoing Thanks to pseudostaffers Dan Romanchik KB6NU, Jeff Davis KE9V, and Steve Lampereur KB9MWR for continuing to spot, and write about "Zero Retries Interesting" type items, on their respective blogs, from Amateur Radio and beyond, that I don't spot on my own.

- Southgate Amateur Radio News consistently surfaces "Zero Retries Interesting" stories.

- The Substack email publishing platform makes Zero Retries possible. I recommend it for publishing newsletters.

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All previous issues of Zero Retries are available without restriction (no paywalls). For some background, Zero Retries 0000 was the **Introduction Issue**. Zero Retries 0026 and Zero Retries 0027 were a **2021 Year End Review** of Zero Retries.

More bits from Steve Stroh N8GNJ:

- SuperPacket blog - *Discussing new generations of Amateur Radio Data Communications - beyond Packet Radio (a precursor to Zero Retries)*

- N8GNJ blog - *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs - Bellingham, Washington, USA*

Thanks for reading!
Steve Stroh N8GNJ (He / Him)
These bits were handcrafted in beautiful Bellingham, Washington, USA
2022-02-11

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